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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,205

09/22/2006

Yuichiro Sasaki

41341

5783

52054 7590 08/06/2009

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EXAMINER

PHAM, THANHHA S

ART UNIT

PAPER NUMBER

2894

NOTIFICATION DATE

DELIVERY MODE

08/06/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patdocket@pearne.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/599,205	<b>Applicant(s)</b> SASAKI ET AL.	
	<b>Examiner</b> Thanhha Pham	<b>Art Unit</b> 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 5/12/2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 14-17 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-17, 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

This Office Action is in response to Applicant's Election dated 5/12/2009.

### ***Election/Restrictions***

1. Applicant's election of claims 14-17 and 19-21 in the reply filed on 5/12/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 22-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**3. Claims 14-16 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Murakawa et al [US 2004/0241968].**

► With respect to claims 14-16, Murakawa et al (figs 1-4, text [0001]-[0086]) discloses the claimed impurity introducing method comprising:

a step of introducing an impurity selected from a group consisting of B, As, P, Sb and In into a surface of a semiconductor substrate (12, fig 1, text [0041], [0052] & [0075]) *[claim 14]*; and

a step of radiating inactive plasma (text [0041], [0053]-[0059], [0075]-[0079] & [0083], more particularly text [0078]-[0079] & [0083]: *plasma annealing using RLSA after doping impurities into the substrate inherently includes the step of radiating inactive plasma (plasma comprising rare gas element Ar to recover lattice defect and place the impurity at the crystal lattice position without damaging the semiconductor substrate)*) to the surface of the semiconductor substrate after the impurity introducing step, wherein the step of radiating the plasma inherently includes a step of radiating plasma such that the impurity possesses a desired impurity profile in the semiconductor substrate, wherein the step of radiating the plasma inherently includes a step of radiating plasma which contains at least one kind of rare gas element *[claims 14-16]*.

► With respect to claims 19-21, Murakawa (text [0041]) discloses the step of introducing the impurity includes a plasma-doping step, ion-implanting step or gas doping step.

**4. Claims 14, 16-17 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang [US 6,051,482].**

Yang et al (figs 4A-4F, cols 1-5) discloses the claimed impurity introducing method comprising:

a step of introducing an impurity selected from a group consisting of B, As, P, Sb and In into a surface of a semiconductor substrate (400, fig 4B, col 4 lines 15-38), wherein said step of introducing the impurity includes a ion-implanting step *[claims 14 and 20]*; and

a step of radiating inactive plasma (col 4 lines 39-55: *plasma doping to form very shallow P-type layer 440 ( after removing the sacrificial layer) using mixture of boron dopants and He inherently including the step of radiating inactive plasma (plasma comprising are He element)*) to the surface of the semiconductor substrate after the impurity introducing step, wherein the step of radiating the plasma inherently includes a step of radiating plasma which contains at least one kind of rare gas element, wherein the step of radiating the plasma includes a step of radiating He plasma *[claims 14 and 16-17]*.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2894

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thanhha Pham/  
Primary Examiner, Art Unit 2894